

## CLAIMS

- Sub B' 1. A method of determining a motion vector for a macroblock of a present image from a previous image, the method comprising:
- selecting a predetermined pattern of pixels in the previous image;
  - computing a difference measure for each of a plurality of pixel blocks in the previous image to form a plurality of difference measures using the predetermined pattern of pixels;
  - selecting an origin block from the plurality of pixel blocks having a lowest difference measure; and
  - computing the motion vector using the origin block and the macroblock.
2. The method of Claim 1, wherein the predetermined pattern of pixels includes less than or equal to half of the pixels in the previous image.
3. The method of Claim 1, wherein the predetermined pattern of pixels includes a fourth of the pixels of the previous image.
4. The method of Claim 1, wherein the y-coordinate modulo four of each pixel in the predetermined pattern of pixels has a y-coordinate is equal to three or zero.
5. The method of Claim 1, wherein computing a difference measure for each of a plurality of pixel blocks in the previous image to form a plurality of difference measures using the predetermined pattern of pixels further comprises:
- computing an absolute difference between each pixel in both the pixel block and the predetermined pattern with a

corresponding pixel in the macroblock to create a plurality of absolute differences;

summing the plurality of absolute differences to compute the difference measure.

6. The method of Claim 1, wherein computing a difference measure for each of a plurality of pixel blocks in the previous image to form a plurality of difference measures using the predetermined pattern of pixels further comprises:

computing a squared difference between each pixel in both the pixel block and the predetermined pattern with a corresponding pixel in the macroblock to create a plurality of squared differences;

summing the plurality of squared differences to compute the difference measure.

7. A method of determining a motion vector for a macroblock of a present image from a previous image, the method comprising:

selecting a predetermined pattern of pixels in the previous image;

selecting a subpattern of pixels from the predetermined pattern of pixels;

computing a first difference measure for each of a first plurality of pixel blocks in the previous image to form a plurality of first difference measures using the subpattern of pixels;

selecting a first closest matching pixel block from the first plurality of pixel blocks having a lowest first difference measure; and

computing a first accurate difference measure for the first closest matching pixel block using the predetermined pattern of pixels.

8. The method of Claim 7, wherein the predetermined pattern of pixels includes a fourth of the pixels of the previous image.

9. The method of Claim 7, wherein the y-coordinate modulo four of each pixel in the predetermined pattern of pixels has a y-coordinate is equal to three or zero.

10. The method of Claim 7, wherein the subpattern of pixels includes a fourth of the pixels of the predetermined pattern.

11. The method of Claim 7, wherein computing a first difference measure for each of a plurality of pixel blocks in the previous image to form a plurality of first difference measures using the subpattern of pixels comprises:

computing an absolute difference between each pixel in both the pixel block and the subpattern with a corresponding pixel in the macroblock to create a plurality of absolute differences;

summing the plurality of absolute differences to compute the first difference measure.

12. The method of Claim 7, wherein computing a first accurate difference measure for the first closest matching pixel block using the predetermined pattern of pixels comprises:

computing an absolute difference between each pixel in both the pixel block and the predetermined pattern with a corresponding pixel in the macroblock to create a plurality of absolute differences;

summing the plurality of absolute differences to compute the first accurate difference measure.

13. The method of Claim 7, further comprising  
computing a second difference measure for each of a  
second plurality of pixel blocks in the previous image to  
form a plurality of second difference measures using the  
subpattern of pixels;

selecting a second closest matching pixel block from  
the second plurality of pixel blocks having a lowest  
difference measure; and

computing a second accurate difference measure for a  
second closest matching pixel block using the predetermined  
pattern of pixels.

14. The method of Claim 13, further comprising:

selecting the first closest matching pixel block as an  
origin block when the first accurate difference measure is  
less than or equal to the second accurate difference  
measure;

selecting the second closest matching pixel block as  
the origin block when the second accurate difference measure  
is less the first accurate difference measure; and

computing the motion vector using the origin block and  
the macroblock.

15. A video encoder configured to determine a motion vector  
for a macroblock of a present image from a previous image, the  
video encoder comprising:

a frame buffer configured to store the macroblock and  
the previous image;

a first first-phase processing unit coupled to the  
frame buffer and configured to compute a first plurality of  
difference measures using a predetermined pattern of pixels;

a comparator coupled to the first first-phase processing unit and configured to select an origin block based on the plurality of difference measures.

16. The video encoder of Claim 15, further comprising a cache coupled between the frame buffer and the first first-phase processing unit.

17. The video encoder of Claim 15, further comprising a second first-phase processing unit coupled to the frame buffer and configured to compute a second plurality of difference measures using the predetermined pattern.

18. The video encoder of Claim 15, further comprising a first second-phase processing unit coupled to the first first-phase processing unit and the comparator, wherein the first second-phase comparator is configured to compute a difference measure using a subpattern of pixels.

19. The video encoder of Claim 18, further comprising:  
second first-phase processing unit coupled to the frame buffer and configured to compute a second plurality of difference measures using the predetermined pattern; and  
a second second-phase processing unit coupled to the second first-phase processing unit and the comparator, wherein the second second-phase comparator is configured to compute a difference measure using the subpattern of pixels.